I. C. 7497 APRIL 1949

UNITED STATES
DEPARTMENT OF THE INTERIOR
J. A. KRUG, SECRETARY

BUREAU OF MINES
JAMES BOYD, DIRECTOR

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MINING PRACTICES AT THE HARRINGTON-HICKORY MINE
BEAVER COUNTY, UTAH

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BY

PAUL T. ALLSMAN

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UNITED STATES DEPARTMENT OF THE INTERIOR - BUREAU OF MINES

MINING PRACTICES AT THE HARRINGTON-HICKORY MINE, BEAVER COUNTY, UTAH[1]

By Paul T. Allsman[2]

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INTRODUCTION, SUMMARY, AND ACKNOWLEDGMENTS

This paper describes metal-mining practices at the Harrington-Hickory lead-silver-zinc mine at Milford, Beaver County, Utah. The operations of the Harrington-Hickory incorporate a number of features that should prove of interest and value to other operators of small mines. These features include employee participation in profits, a well-laid-out electrical system, adequate financing, a well-balanced equipment and supply inventory, a well-organized system of bookkeeping, adequate roads, and good management. As crude ore is shipped directly to smelters and mills in the Salt Lake Valley, close attention is paid to see that the ore is segregated by classes and treated where it can bring the greatest net return.

A combination of these features has resulted in maintaining relatively low costs, considering the grade and size of ore shoots at a time, during and following the war, when equipment, supplies, and labor were costly and difficult to obtain. The period covered in this report includes two war years and two years following, from April 1, 1944 to June 30, 1947.

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[1] The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is used: "Reprinted from Bureau of Mines Information Circular 7497."

[2] Chief, Salt Lake City Branch, Mining Division, U. S. Bureau of Mines.

The following sections describe the situation and physical features; briefly relate early and recent history; and include recent production tabulations. The geology and deposits are described; development and stoping methods are outlined, including costs; power distribution is explained; and equipment and surface plant are mentioned. Labor relations are explained in detail, and a copy of the contract is included in the appendix.

The author is indebted to James D. Williams, lessee and operator of the property, for making these data available.

SITUATION AND PHYSICAL FEATURES

The Harrington-Hickory mine is situated 5 miles west of Milford, in Beaver County, Utah, near the north end of the Star Range, on the east side, at an altitude of 5,600 feet. It is reached from Milford by a graveled road running directly west from the loading ramps on the Union Pacific Railroad to the mine.

Milford is well situated for obtaining mining equipment and supplies from distribution centers, as it is on the main line of the Union Pacific Railroad, 207 miles south of Salt Lake City and 578 miles northeast of Los Angeles.

The Star Range is one of many north-south trending ranges in the Desert Province. The climate generally is hot and dry in summer and, although cold in winter, snows seldom hamper trucking operations.

The little timber needed for mining must be shipped in, as none is available in the desert ranges. Water generally is scarce for surface operations. However, as the Harrington-Hickory is opened to below the permanent water table, it is ample.

EARLY HISTORY AND PRODUCTION

The Harrington-Hickory mine is one of the oldest in the Star mining district and was probably first operated during 1872-1875, when rich lead-silver ore was extracted. High-grade silver ore was mined at the surface, as evidenced by numerous shallow cuts. During 1900 the property was acquired by the Majestic Mines Co., which operated it until about 1912.

This company mined ore from the Harrington fissure to the 500-foot, or permanent water level. The Gomer shaft was sunk to below the 600-foot level, and some crosscutting was done toward the ore-bearing fissure. Water encountered below the 500-foot level eventually forced a stoppage of mining.

The property was acquired by Ezra Barton, George Miller, and associates at Beaver, Utah, by purchase at a tax sale in 1933 under the name of the New Majestic Mining Co. The mine was under lease after 1933, when some mining and development was done.

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Records of early production are incomplete on mining to 1910. From 1910 to the time the present operation began, it has been estimated that 7,500 tons of ore containing 22 percent lead and 18 ounces of silver per ton was mined. A partial record of shipments after 1933 showed 14 lots aggregating 548 tons and containing 21 percent lead, 18.1 ounces of silver per ton, 45.5 percent insoluble, and 7.6 percent iron.

RECENT HISTORY AND PRODUCTION

James D. Williams, the present operator, obtained a 10-year lease with option to purchase the Harrington-Hickory property in June 1943. A $5,000 rehabilitation loan was obtained from the Reconstruction Finance Corporation in August 1943. Equipment and supplies were purchased, a mining crew of known ability was assembled, and rehabilitation began on September 5, 1943.

The 5 miles of road from Milford to the mine was repaired, a hoist house and change room were erected, a small hoist was installed, and the shaft was repaired. The 500-level station was then cleaned up, a 440-volt, 3-phase power line, and a 100-horsepower, submersible, 8-stage pump were installed in the shaft, and unwatering below the 500 level was begun. While unwatering was progressing, light circuits were installed and track was relaid to the working places on the 500 level.

All exposures were sampled, and two promising ore shoots were selected, from each of which a carload shipment was mined by hand mining. As a result of the sampling and carload shipments, an additional $6,000 development loan was granted by the R. F. C. in November 1943, and a $30,000 mining loan was granted in December 1943. These loans provided funds for completely equipping the mine for full-scale operation.

The following tables give the production of ore by classes from April 1, 1944, to June 30, 1947.

TABLE 1. - Production of ore from Harrington-Hickory mine, by classes of ore, April 1, 1944 to June 30, 1947[1]

	Siliceous ore to Garfield plant	Oxide lead-silver to Murray plant	Oxide lead-zinc to Tooele plant[2]		Sulfide lead-zinc to Midvale mill	Total
			+10 percent zinc	-10 percent zinc		
Tons	250.08	3,085.68	2,971.04	1,589.36	1,408.73	9,304.89
Gross value..	2,411.21	65,339.85	153,394.14	42,417.95	92,790.85	357,354.00
Value per ton	9.64	21.18	51.63	26.69	66.58	38.40

[1] Value of ore based on market value of metals at time of settlement and premium payments by M. R. C. are not included.

[2] No zinc payed for by smelter if settlement assay is less than 10 percent zinc.

TABLE 2. - Production of metals from the Harrington-Hickory mine, by years, April 1, 1944 to June 30, 1947

	Year				Total
	1944	1945	1946	1947	
Tons	1,318	3,070	3,798	1,118	9,304
Silver (ounces)	7,191	28,723	28,992	6,444	71,350
Lead (pounds)	232,519	777,625	954,208	213,104	2,177,456
Zinc (pounds)1/	122,049	530,056	521,408	266,931	1,440,444

1/ Includes only zinc paid for by smelter.

DESCRIPTION OF THE DEPOSITS

The rock formation in the Harrington-Hickory and vicinity are thin-bedded calcareous shales with interbedded limestones and lenses of quartzite, named by Butler3/ the Harrington formation. The general strike of the sedimentary beds is N. 10° to 15° E., and the dip is about 35° to 40° E.

The ore deposits, classified by Butler as replacement fissure deposits, are in the form of irregular pipes at the intersection of parallel fissures with a massive limestone member that is physically and chemically favorable to replacement. The strike of the fissures is N. 60° to 65° E., and the dips are 75° to 80° N. Development and mining has been conducted on two fissures - the Adelia and the Harrington.

The ore shoots comprise oxides of lead and zinc carrying silver and some copper to the depth of the permanent water table near the 500-foot level of the mine. Below this level the ore metals are sulfides, comprising galena, sphalerite, and chalcopyrite. The shoots so far mined are greatly enlarged at the water level and immediately above, and where mined below the water level are somewhat larger than normal in section.

The ore is high-grade throughout, and most of it has been shipped for direct smelting. Some of the richest ore has come from the sulfide zone below the 500-foot level.

A promising fissure, named the Copper fissure, south of those that have been mined is being explored. High-grade silver-copper ore has been mined from this fissure from the surface, and early shipments are reported to have assayed upwards of 500 ounces silver per ton. Samples taken at the start of present development in the surface cuts show an average of 35.6 ounces silver per ton across 5 feet of width.

DEVELOPMENT

Prior to the present operation, the Harrington-Hickory has been developed by three shafts - the Gemer shaft, 604 feet in depth; the Adelia shaft, 396

3/ Butler, B. S., Geology and Ore Deposits of the San Francisco and Adjacent Districts, Utah: U. S. Geol. Surv. Prof. Paper 80, 1913, 194 pp.
Butler, B. S., Loughlin, G. F., Heikes, V. C., and others, The Ore Deposits of Utah: U. S. Geol. Surv. Prof. Paper 111, 1920, 504 pp.

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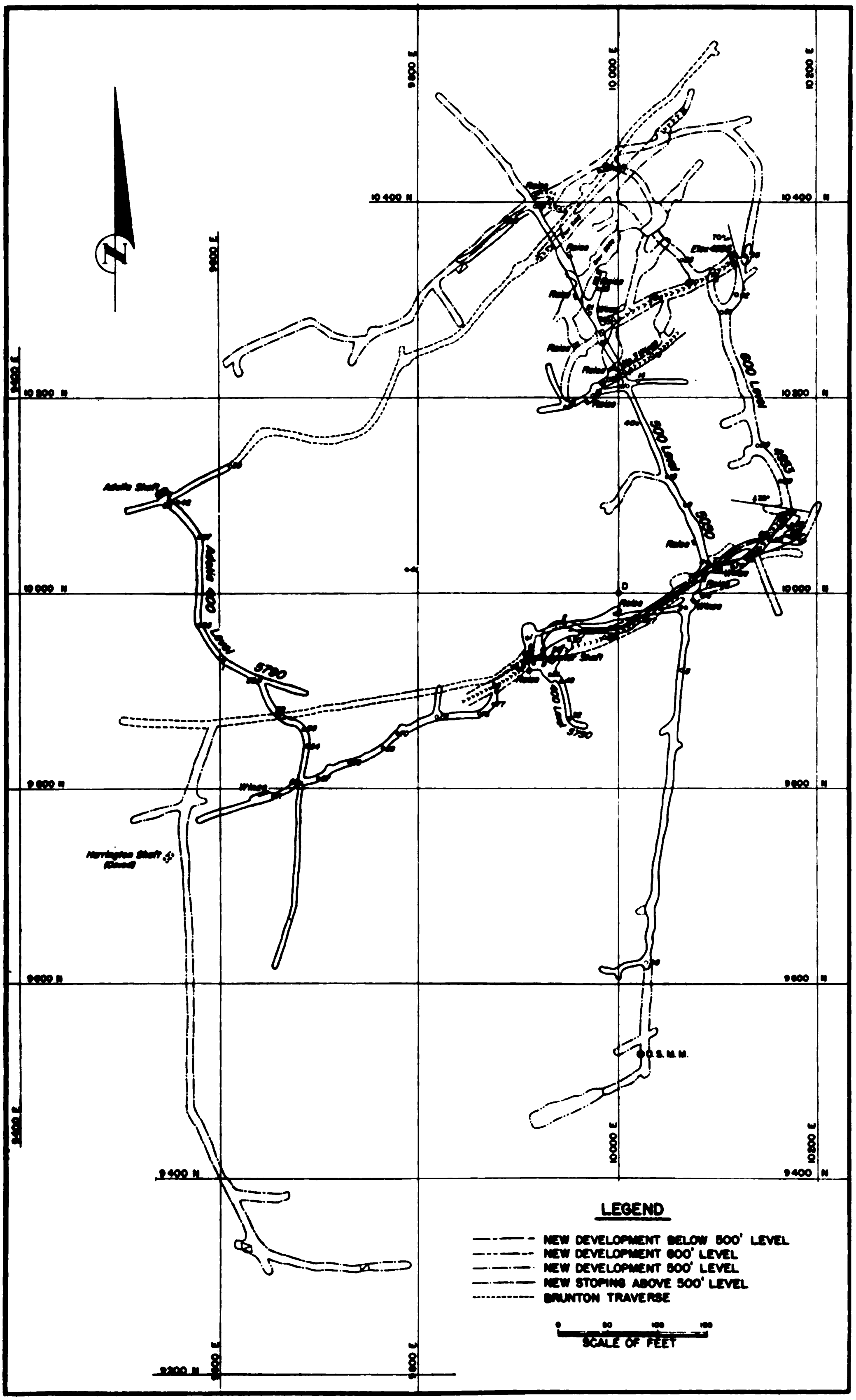

Figure 1. - Plan of Harrington-Hickory mine, showing new development and stopes.

feet in depth; and an inclined shaft. The Gomer shaft, which is the one being used at present, is a vertical, two-compartment, timbered shaft in excellent condition. When the present operation began, there were about 3,000 feet of drifts and crosscuts on various levels.

Since 1944, 2,409 feet of crosscutting and drifting has been completed for exploration and development of ore. Some inclined raises and winzes have been excavated, mostly in connection with stope preparation and ore extraction. The development and stoping done by the present operator is shown on figure 1.

All drifts and crosscuts are run 5 by 7 feet in cross section, and no timbering has been required, except to support chutes.

Generally, a 15-hole round comprising five rows of three holes each is required to break the ground. Three-inch, drifters, 1-1/8-inch, hollow-round, lugged drill steel and detachable bits are used for drilling. Forty percent gelatin dynamite is used for blasting.

All drifting and crosscutting is done on a contract by two miners at $7 a foot. The operator furnishes everything but labor. The contractor delivers the broken rock to the cage at the shaft, where it is hoisted at company expense. A normal cycle of operation comprises drilling, blasting, mucking, and tramming, one round per shift by two men.

The details of costs in units of labor, power, and supplies per foot of development are given in the following table.

TABLE 3. - Details of costs, in units of labor, power, and supplies, per foot of development - crosscutting and drfiting

Total feet, crosscutting and drifting, 2,409. Period covered, April 1, 1944 to June 30, 1947. All untimbered. Rock, limestone, and silicified limestone. Size of excavation, 5 by 7 feet.

		Cost per foot
A. Labor (man-hours per foot):		
Drilling and blasting	2.50	$2.91
Mucking and tramming	2.50	2.91
Hoisting	1.25	1.45
Supervision	.62	.73
Total labor	6.87	8.00
Feet per 8-hour hour shift	3.2	
B. Power and supplies (per foot):		
Explosives (pounds per foot)	11	2.00
Power (kw.-hr. per foot)	95	1.80
Other supplies (cost per foot)	2.25	2.25
Total power and supplies		6.05
Total labor, power, and supplies		14.05
C. Labor (percent of total cost)		56.9
Power (percent of total cost)		12.8
Supplies (percent of total cost)		30.3

STOPING

The stoping done by the present operator is shown on figure 1.

Except for the enlarged zone above the 500-foot level, the ore shoots are fairly regular pipes striking N. 60° to 65° E. and dipping about 35° NE. The ore has been stoped from a few feet to about 25 feet on the strike of the beds and up to 15 feet normal to the bedding. Within a zone roughly 50 feet above the 500-foot level to about 50 feet below the 500-foot level, the ore shoots have enlarged and formed irregular bodies up to 150 feet on the strike and 25 to 30 feet normal to the bedding. Below the 500 level in the primary zone, ore shoots maintain the pipelike shape found above the enlarged zone, having an average cross section of about 15 by 25 feet.

An open-stope method of mining has been used throughout. Occasional casual pillars have been left in the enlarged zone. Most stopes are steep enough to permit ore to flow by gravity, except in the enlarged zone, where irregularities make it necessary to use scrapers powered by an electric hoist.

Chutes are installed on the level where the ore is accumulated. While ore is being drawn into 16-cubic foot ore cars, a second car is spotted back of it, and waste is sorted from the ore and discarded to the second car. The records show that one car of waste is sorted for each 3.4 cars of clean ore. Loaded cars are trammed to the shaft station and caged to surface, where the hoistman dumps the ore into one of four 60-ton bins, depending on the grade and class of ore.

Wet stopers are used for drilling in stopes. No set system of drilling round is used, but holes are pointed and spaced to break the ore according to the best judgment of the miner.

The following table is a summary of costs in units of labor, power, and supplies per ton of ore hoisted in 1946 for development and stoping.

TABLE 4. - Summary of costs in units of labor, power, and supplies per ton of ore hoisted

Total ore hoisted 3,798 tons. Period covered, 1946.

	Development	Stoping	Total
A. Labor (man-hours per ton):			
Drilling and blasting	0.770	0.496	1.266
Mucking and tramming	.770	1.487	2.257
Hoisting	.385	.496	.881
Supervision	.192	.496	.688
Total labor underground	2.117	2.975	5.092
Average tons per man shift	3.78	2.69	1.57
Labor percent of total cost	10.0	63.8	73.8

TABLE 4. - Summary of costs in units of labor, power, and supplies per ton of ore hoisted (Cont'd.)

	Development	Stoping	Total
B. Power and supplies:			
Explosives (pounds per ton)	4.28	1.82	6.10
Total power (kw.-hr. per ton)	43.90	29.40	73.20
1. Air compression and lights	8.78	5.85	14.62
2. Hoisting	2.92	1.95	4.88
3. Pumping	32.20	21.60	53.80
Other supplies in percent of total supplies and power	17.5	8.1	25.6
Supplies and power percent of total cost	9.9	7.1	17.0
C. Percent of total cost	20.1	70.7	90.8

POWER DISTRIBUTION

Power is obtained from the Telluride Power Co. line extending from Milford to the mine, where it is fed to a bank comprising three 75 kv.-a., 5,000 to 480 volt transformer. The average cost of power has been $0.0189 per kw.-hr. Power is conducted to the mine through the Gomer shaft by a 440-volt, 3-phase circuit. Three-phase, 440-volt, submarine cable is installed from the shaft to working places to run the tugger hoists for scrapping. Transformers furnish 110-volt electric power throughout the mine for lighting.

The mine is at the end of a rather long transmission line, and frequent interruptions have caused the loss of considerable time in working below water level. Because of this uncertainty, operations below water cannot be resumed until a more reliable source of power for pumping is obtained.

AIR COMPRESSION AND DISTRIBUTION

Compressed air is furnished by a 420-cubic foot, 2-stage, air-cooled, 75-horsepower air compressor. It is distributed to the mine by a 3-inch air line through the shaft and 2-inch lines through main drifts. One-inch air lines conduct air to the face of stopes and development headings. One air receiver is installed at the surface and two others are installed close to principal working places for efficiency.

EQUIPMENT AND SURFACE PLANT

Following is a list of the major equipment in use at the Harrington-Hickory mine.

1 - Air compressor, 420-cubic foot, 2-stage, air cooled, 75 h.p.
1 - Hoist, single drum, 50 h.p. with automatic thruster brake and Lilly control.
3 - Transformers, 75 kv.-a., 5,000 to 480 volt.
1 - Arc welder, 20 h.p., 300 amp.

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1 - Station pump, 125 h.p., 2-stage rated at 600 gpm. at 500-foot head.
1 - Turbine pump, 20 h.p. rated at 700 gpm. at 100 feet.
2 - Tugger hoists, 7-1/2 h.p. electric.
1 - Tugger, 3 h.p., air.
2 - Drifters, 3-inch, wet.
5 - Stopers, 2-3/4-inch, rotating, wet.
4 - Jackhammers, 2-3/4-inch, wet.
12 - Ore cars, 16-cubic foot.
4 - Ore bins, 60 tons capacity.
1 - Small booster blower.
3 - Air receivers.

Surface buildings, all of wood frame construction, comprise the following:

1 blacksmith shop, 14 by 18 feet
1 warehouse, 20 by 24 feet
1 change room, 24 by 28 feet
1 compressor house, 14 by 20 feet
1 hoist house, 12 by 16 feet

The property is completely equipped with small tools, and a complete inventory of replacement parts for all equipment is maintained in the warehouse. An adequate reserve of all needed supplies, such as explosives, is also maintained.

DISTRIBUTION OF SMELTER RETURNS

All the ore mined has been shipped to smelters in the Salt Lake Valley. All was direct smelting ore except 1,408.73 tons, which was milled at Midvale before smelting.

A great amount of study has been given to smelter schedules and classifying the ore at the mine in order to obtain the most favorable smelter rates. Oxide zinc ore is separated from lead-silver ore, and the resulting high-grade zinc is shipped to a zinc-fuming plant. Sulfide lead-zinc is kept separate from oxidized lead-zinc and oxide zinc ores.

The following table shows, by years, the distribution of the gross value of the ore before premium additions, by percent, from April 1, 1944, to June 30, 1947.

TABLE 5. - Distribution of smelter returns

	Year			
	1944	1945	1946	1947
Metal deductions	50.3	48.8	46.1	53.0
Treatment charges	24.2	13.1	24.7	17.0
Freight and hauling	10.6	8.2	7.0	5.5
Sampling and assaying	2.7	1.4	2.7	2.0
Royalty	1.4	2.9	2.0	2.3
Net f.o.b. mine bin	10.8	25.6	17.5	20.2
	100.0	100.0	100.0	100.0

LABOR RELATIONS AND CONTRACTS

At the beginning of each calendar year all employees meet with the operator to settle conditions under which they will work during the year. All present, including the manager, have one vote on all issues except rate of labor payments. A simple majority vote on other issues settles them for the year. The following conditions are discussed and settled.

1. The time and duration of holidays.
2. Amount to be paid on footage contracts in development.
3. Terms of the ore-production contracts.
4. Wage scale when employee is not covered under a contract.
5. Block or blocks to be worked are assigned to individuals or groups.
6. The program of development is outlined.
7. General needs and suggestions for improving working efficiency such as new equipment and special supplies.

In the past, all development has been done on contract at $7 a foot where the company furnishes everything but labor. The contractor delivers the waste to the shaft station, where it is hoisted by tho company.

The most important feature of the success of labor relations is the "Ore Production Contract," which is reproduced in the appendix. The results of the methods of employce payments are shown in the following table, which covers the year 1946 and is typical.

TABLE 6. - Contract payment distribution

	Ore production contracts		Development contracts	
	Shifts worked by individual	Average earnings per shift	Shifts worked by individual	Average earnings per shift
	290	$26.40	304	$11.75
	292	26.20	307	10.35
	250	18.45	212	9.85
	290	14.15	182	10.90
Total and average	1,411	19.87	1,005	10.77

Average per shift all contracts = 2,416 shifts, $16.08.

Because the operation is comparatively small and ore shipments are intermittent, it has been found to be more economical to contract for the hauling of ore to the railroad by local trucking companies rather than to maintain standby equipment and personnel to do this work.

SUMMARY OF COSTS

The following table gives the cost of mining and includes all development and ore-production cost up to delivery of ore to bins at surface and waste to surface dumps.

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TABLE 7. - Summary of costs

Harrington-Hickory mine, period 1946.
Tons of ore hoisted, 3,798.
Method of mining, open stope.

	Per ton		
	Development	Stoping	Total
Labor:			
Drilling and blasting	$0.75	$2.63	$3.38
Mucking and tramming	.75	7.87	8.62
Hoisting	.29	.94	1.23
Supervision	.18	.95	1.13
Total labor	1.97	12.39	14.36
Power and supplies:			
Explosives	.68	.29	.97
Power	.83	.56	1.39
Other supplies	.58	.27	.85
Total power and supplies	2.09	1.12	3.21
Total labor, power, and supplies	4.06	13.51	17.57
Depreciation			1.20
Insurance			.58
Total indirect cost			1.78
Total direct and indirect cost			19.35

APPENDIX

ORE PRODUCTION CONTRACT

THIS AGREEMENT, made and entered into this _______ day of ___________, 194__, by and between (_______________) of the Town of Milford, Beaver County, State of Utah, party of the first part, and ____ of the same place, party of the second part, WITNESSETH:

WHEREAS, party of the first part is in possession of certain mining claims in the North Star Mining District of Beaver County, Utah, known as the Harrington-Hickory Mine, under lease and option to purchase, with the full right to extract ores therefrom; and

WHEREAS, party of the first part has secured certain financing from the Reconstruction Finance Corporation, under a certain operational agreement, and is operating said mine subject to the provisions of said agreement and the rules and regulations of RFC; and

WHEREAS, party of the first part is desirous of having ores extracted from said mine by party of the second part under the arrangement and upon the terms and conditions following; and

WHEREAS, party of the second part is willing to extract ores from said mine under the said arrangement and upon the terms and conditions following:

NOW, THEREFORE, for and in consideration of the premises and of the mutual promises of said parties made one to the other, said parties to hereby agree as follows, to-wit:

1. That second party shall work in and extract ores from a certain block of ground between the __________ and __________ levels of what is commonly called ______________________, and consisting of a block of ground approximately ____ ft. wide, _____ ft. thick and _____ ft. long, having the center point of said ______________________ as shown on R. F. C. maps, as reference point.

2. That this contract shall be effective and in force (unless sooner terminated through forfeiture as more particularly set out herein-after), for a period of ______________________ from and after the date, hereof; and thereafter shall remain in force and effect until cancelled by either party upon thirty days' written notice upon the other party.

3. That second party shall commence work upon said ground on or before the _____ day of ___________, 194__, and thereafter do and perform not less than ________________________ of labor each calendar month during the life of this agreement;

4. That second party shall do all work upon said premises with due regard to the safety, development and preservation of the said ground being worked and the mine in which said ground is situated, all as a workable mine, and to securely and properly timber all openings and workings from which earth and ore is being removed, where timbering shall be necessary and proper in accordance with good mining.

5. That the first party or his duly authorized agents shall have the right at any time and all reasonable times to enter upon the ground described in this agreement and any and all parts thereof for the purpose of inspection and examination.

6. That the second party shall keep at all times the drifts, shafts, tunnels and other workings being worked by him thoroughly drained and clear of loose rock and rubbish, unless so prevented by extraordinary casualty.

7. Second party shall comply with the laws of the United States and the State of Utah with respect to working mining ground herein described and the employment of labor thereon.

8. That second party shall keep any and all mining machinery and equipment and personal property of the first party being used by him, in a state of good repair, reasonable wear and tear excepted, and shall not commit waste, or use same negligently or in such a manner as to permit undue waste or deterioration thereon.

9. That first party agrees to furnish to and for the use of second party, necessary air, hoisting machines, steel, bits, hoses, small tools, cars, powder, fuse, caps and carbide, timber, assays, and such other miscellaneous mining equipment and services as are reasonably necessary to pursue the work herein contemplated; and that second party shall furnish all labor in the work of exploiting said ground and extracting ore therefrom.

10. It is understood and agreed by and between the parties hereto that in complying with the provisions of paragraph 9 hereof, said first party shall not be called upon nor be required to furnish mining equipment, tools and timber not available upon said mining property and/or in use elsewhere in said mine; and shall not be called upon nor required to furnish powder, fuse, caps and carbide when the same is not available for purchase by him; and it is further understood and agreed that in the event of any breakdown of machinery necessary to provide air and hoisting, or in the event of electrical failure, first party shall not be considered responsible therefor and shall not be liable to second party for any damages whatsoever, unless breakdown and/or failures be caused through his intentional misconduct or through his gross negligence.

11. That the profits from the production of ores extracted by second party shall be divided as follows:

(a) There shall be deducted from the net amount received from the smelter and/or mill to which ores are sent, plus net bonus or bonuses and/or subsidy payments received from the Metals Reserve Company, all items of expense incurred in the production of said ores, (excluding mine manager or superintendent's salary, office expense, traveling expense, personal property taxes and capital additions), and any balance remaining shall belong one-half to first party and one-half to second party;

(b) Items of expense and deductible before said division, shall include social security levies, unemployment insurance or payments, workman's compensation insurance premiums and mine occupation tax.

(c) All hoisting costs and air generation costs are to be charged as expenses at the rate of One Dollar ($1.00) per ton on all ore and/or waste hoisted out of the mine and produced from said block of ground. Other expenses shall be ____ on each ton of ore produced from said block of ground.

12. That second party shall not purchase any supplies whatsoever on account of or charged to first party; and in the event second party shall make any purchases whatsoever in connection with his mining operations as herein set forth, the same shall be in his name and borne entirely by him.

13. That said second party does hereby certify and declare that he is well acquainted with and has read the operational agreement between first party and the RFC and the rules and regulations under which he is operating said mine, and he agrees to be fully bound thereby insofar as the same may effect or in anywise be connected with his work and operations, and it is expressly agreed that this contract is subject and subordinate to such RFC operational agreement, and all rules and regulations in connection therewith.

14. It is further agreed by and between the parties hereto that in the event of any dispute or controversy concerning any of the provisions of this contract or construction of same, or any rights, privileges or obligations thereunder, to submit such dispute or controversy to the Supervising Engineer of the RFC; and his decision thereon shall be accepted by both parties hereto as final.

15. It is further agreed, understood and declared by both parties hereto that the first party does not control or direct the work herein provided to be done by second party, and that second party is free from control or direction over the performance of the work, or any work which he may choose to do by virtue of and in and under this agreement, excepting that such work must be done in a good and minerlike manner, and as otherwise specifically provided in this agreement.

16. That all ores shall be shipped in the name of the first party, but that second party shall be entitled to a full, true and correct copy of each and every settlement, together with a full, true and correct accounting of expenditures, charges and settlements; and that settlement shall be made by first party to second party as follows:

Concerning all monies received by first party as the proceeds from the sale of ores and/or bonuses and/or subsidy payments up to the last day of the month and being payments to which second party is entitled as such payments are hereinbefore more particularly defined, first party shall requisition the RFC. on or before the tenth day of the following month, and first party shall pay over such monies to second party within five days after his receipt of approval of such requisition. Provided, however, that in the event of termination of this agreement for any cause whatever, first party may retain from the final settlement due second party a reasonable sum of money to cover the prorated portion of the mine occupation tax on the ore produced by second party, until such time as said tax has been determined, and then to pay same promptly. It is understood and agreed that when this pro-rated amount has been paid, first party will promptly refund to second party any excess amount that may have been withheld.

17. It is hereby understood and agreed that should second party fail, refuse or neglect to do the minimum work herein required, or cause same to be done, or fail, refuse or neglect to perform any one or more of the additional covenants contained in this instrument upon his part to be performed, then said first party may at his option declare this agreement terminated and cancelled without notice, and the same shall thereupon immediately terminate, and in such event and upon being advised by first party, or in event of a termination as provided in paragraph 2 hereof, second party agrees to immediately deliver up to said first party the peaceable possession of the premises herein described and every part thereof; provided, however, second party shall be entitled to remove ore already broken as of the date of termination of this contract, in the event he shall elect to remove same as quickly as it may reasonably be done.

18. It is further understood and agreed that second party shall not have any right of assignment hereunder, unless by consent of the first party first had and obtained in writing; and while this agreement shall be binding upon and shall inure to the benefit of the heirs, administrators, executors or assigns of the first party herein, it shall not inure to the benefit of the heirs, administrators, executors, successors or assigns of the second party, excepting to the extent of settlements for money due second party on account of ore by him produced and shipped.

19. It is further understood and agreed that this agreement shall not be hereafter modified by parol, but shall be considered as modified only in the event such modifications are in writing and subscribed to by both parties hereto.

IN WITNESS WHEREOF, the parties hereunto have set their hands the day and the year in this agreement first above written.

Party of the First Part.

Witness:

Party of the Second Part.

ORE PRODUCTION CONTRACT SETTLEMENT

(Owner)
Harrington-Hickory Mine
Milford, Utah

Date ____________

Contract Owner ______________ No. ________ Contract Location ____________

ORE PRODUCTION EXPENSES:		Contract Lot No.	________
Period Covered ________ to	________	Date Shipped	________
Hoisting and Air	________	Railroad Car No.	________
Pumping	________	Mine Lot No.	________
Tramming	________	Date of Settlement	________
Insurance, etc.	________		
Steel and Bits	________	Wet Weight, Tons	________
Warehouse Supplies	________	Dry Weight, Tons	________
Explosives, Fuse, Caps	________		
Timber	________	Net Smelter Payment	________
Assaying	________	Premiums:	
Equipment Rental	________	Net "A"	________
Miscellaneous	________	Net "B"	________
		Total Payments	________
Total Expenses	________	Less Expenses	________
		Balance	________
		Contract Pmt. ____%	________
OPERATING ADVANCES:		Less Advances	________
Period Covered ________ to	________	Net Due Contract	________
Labor Furnished	________	Less Assignments	________
Cash Advanced	________		
Transportation	________	Adjustments	________
Insurance, etc.	________		
Miscellaneous	________	Net Payment	________
Total Advances	________	Paid ____________	Check No. ____

See Settlement Sheet from Smelter/Mill attached hereto and made a part hereof.